THE PRESENT STATUS OF THERAPY IN PULMONARY TUBERCULOSIS *

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There can be no more important matter in all medicine for discussion than the treatment of a disease which is still responsible for approximately 10 per cent of all deaths. The death rate in New York City for the past ten years has dropped from 266 per hundred thousand to 123 per hundred thousand, over 50 per cent. This splendid showing will apply to any district in the United States where a well organized campaign has been waged.

How short a time—within the recollection of most of us here tonight—it is since tuberculosis spelt death! How different today, when we can, without fear of contradiction, state that 80 per cent of all beginning cases can be arrested and that practically all tuberculosis is preventable.

Some physicians practicing twenty-five years ago did not tell their patients they had tuberculosis. They were consoled with a diagnosis of bronchitis and sent to the desert or to the mountains to live as long as they could. Today, the physician is remiss in his duty who does not tell his patient the nature of his disease as soon as the diagnosis is certain, because he can hold out hope of definite arrest and restoration to useful existence if the right and proper line of conduct and treatment is pursued.

No treatment in tuberculosis or any other chronic disease can be successful without a rational co-operation between physician and patient. This co-operation is only possible when the patient knows he has tuberculosis instead of a bad cold, pleurisy or bronchitis. No treatment in tuberculosis can be successful without individualization and without a close study of the patient's psychology. It has been my unalterable custom for years to closely observe my patient for at least four weeks after admission before undertaking any special line of treatment. This has a two-fold advantage: First, one gains an exact knowledge of the patient's pathology; second, one learns the peculiarity of his patient's temperament. Not understanding our patient's psychology is responsible for the successful operation of various cults so inimical at the present time to regular medicine. In our desire to try new lines of treatment, some of us sometimes forget the patient. We should study the host more instead of the parasite which feeds on him, and our future results may be better. If we sum up the advances of the past twenty-five years in the treatment of all chronic constitutional diseases, we must conclude that our knowledge and understanding of disease has been greatly augmented; but also, that the net result of all our attempts at successful medical treatment has been small. This applies particularly to tuberculosis. We have learned all about its direct and indirect causes. We have accomplished wonders in its prevention, but we are really as far from a specific cure as ever, although nearly forty years have passed since Koch discovered the tubercle bacilli. During this period, many vaccines and drugs have been tried, but unsuccessfully. Over one hundred different forms of tuberculin have been put on the market, each with its advocates, each to be tried and then relegated to oblivion. Tuberculin has been unsuccessful because it is a toxin, not an antitoxin. It is the product of the tubercle bacillus. It adds nothing new to the system because the tuberculous patient constantly manufactures tuberculin within himself. There can be little difference in these various forms of tuberculin, because they all have the same origin.

Must we not pause and seriously reflect when we contemplate that forty years of scientific research on the tubercle bacillus by the best laboratories and medical minds have failed to produce a specific vaccine; that the same work on tuberculosis in human beings and animals have failed to produce a serum? Is there not a very definite reason for this failure? We explain it with the statement that the tubercle bacillus does not circulate in the blood—that it is locked up in the tissues and only its toxins travel through the system. We also know that the tubercle bacillus has an impenetrable waxy capsule, which cannot be dissolved or penetrated by known methods. If these facts are true, then we shall probably never find the specific for tuberculosis through vaccine therapy!

Let us now review the various present-day methods at our command in the treatment of pulmonary tuberculosis. These divide into

1. Drug treatment.
   (a) Organic extracts.
2. Vaccine therapy.
3. Artificial pneumo-thorax
   (a) Thoracoplasty.
4. Heliotherapy.
5. Hygienic and dietetic treatment.

It would be futile to attempt to recount all the ethical and non-ethical medicinal preparations which from time to time have been exploited. Cod liver oil held its sway for many years, and many physicians still believe in its efficacy. Creosote was once hailed as a specific because it inhibited cough and is still largely in use under its own name, or some trade-name such as Creosotal or Calcreose. I have never seen any worthwhile result from creosote or its compounds, but have often watched a fair digestion ruined by it. Various tonics have a definite place in tuberculosis therapy, as stimulants to appetite, as "blood-builders," in an effort to increase resistance, but they should not be heralded as cures, nor should they so be considered by physicians. I have found that the best way to administer a tonic is hypodermically. I use cacodylate of soda, 10 per cent, very consistently, to the exclusion of cacodylate of iron. Years of experience with both preparations have convinced me that any efficacy to be derived from their use lies almost wholly in the cacodylate, not the iron or soda, and since the former is more painful, why not employ the latter? I am also convinced that intra-venous therapy is unnecessary.

* Read before a meeting of the Spokane (Wash.) Medical Society, October 12, 1922, and the Portland Medical Society, October 18, 1922.

Any vaccine or drug will be absorbed when placed under the skin in sufficient time to accomplish its effect. If there is more rapid absorption through a vein, which is not proven, the increased jeopardy to the patient by the latter method is out of proportion to any gain by it. The only excuse for intra-venous therapy is where a large quantity of a solution has to be used, as in salvarsan, or where injecting under the skin will cause necrosis.

Calcium has a definite place in our drug therapy. The lactate sometimes acts very well in hemorrhage, and calcium chloride, 5 per cent, is of great use in abdominal pain, whether due to errors of diet or to intestinal tuberculosis. It inhibits peristalsis and gives great relief for days at a time. This drug is given intra-venously, starting with 2 cc. increasing to 4 or 5 cc. after four days, and repeating the maximum dose in four days to one week, if necessary. One often sees cessation from pain in twenty-four hours. The method, of course, is not always efficacious.

A word about the use of narcotics. We need morphine, heroin and codeine in the treatment of such symptoms as hemorrhage, cough and pain, but we must be conservative in their use, because a tuberculosis patient can easily be converted into a drug addict.

Organic extracts have no place at present in the treatment of pulmonary tuberculosis. With the exception of pituitrin, which will sometimes stop haemoptysis, they accomplish nothing and often do harm. I have given leucocytic and lymphoid extract and have almost invariably produced hemorrhage. Splenic extract is now being tried—so far without result. Various endocrin products are recommended for tuberculosis, as well as for every other known disease. The study of the endocrin glands is in its infancy. With these products we are again making the vital error of paying no attention to the "host." The practitioner is being exploited by the advertising laboratory, and some of them in turn are doing an injustice to their patients.

Nuforal—A recent nuclein preparation heralded as a tuberculosis cure is nuforal. I personally visited the laboratory in New York, where nuforal is manufactured; was given sufficient ampules to use on ten patients, and promised to report my results. I have had no success, although employing it conscientiously and according to instruction over a period of three months, the time supposedly required for a "cure." I used nuforal because I believe that every widely heralded "cure" should be tried out accurately by someone willing to publish his results, if only to establish, as in this case, that the remedy has nothing but commercial value. The Nuforal laboratory in June showed me a list of over two hundred persons whom they claimed were physicians in the United States and who they also claimed were using their "cure" for pulmonary tuberculosis!

Chaulmoogra oil, I am sorry to say, has failed to live up to the great hope that every study of this drug inspired. After the rather remarkable results accomplished by Dean and MacDonald with the ethyl ester in the treatment of leprosy, it was thought that similar success might be achieved in pulmonary tuberculosis. Walker at the Hooper Research Laboratory of the University of California, after two years' experimentation on animals, with a chaulmoogra oil ester of his own, states that he sees no effect on tuberculous lesions. I was one of those permitted to use both the Dean derivatives of chaulmoogra oil from Honolulu and Walker's preparations from San Francisco. I tried them on fairly well advanced patients for a period of six months, starting with 1/10 cc. and increasing to 2 cc., injecting inter-gluteally. The clinical results were nil, and still reputable chemical firms are advertising a commercial preparation of chaulmoogra oil as a cure for tuberculosis. Some physicians are using this drug on their patients, thus losing valuable time in the application of other more efficacious methods. The failure of chaulmoogra oil in the treatment of tuberculosis was a keen disappointment because I believe that a specific for tuberculosis will be found along chemical rather than bacterial lines.

Vaccine Therapy: We have two classes of vaccines—autogenous and stock—the former being made directly from the sputum, the latter from a culture of tubercle bacilli. Much work has been done during the past two years by competent investigators in culturing sputum, and in preparing a vaccine from pure culture of the various strains obtained directly from washed sputum. The results in conditions, such as chronic bronchitis, asthma, and non-tuberculosis have been encouraging. I have seen chronic coughs of years' standing get well, and asthma, not due to a pollen or protein, improve remarkably under a course of autogenous vaccine injection. But I have rarely seen a vaccine made from tuberculous sputum accomplish anything. This fact alone should convince us that mixed infection plays but a small role in the production of such symptoms as fever, night sweats, loss of weight, loss of appetite and nausea, the syndrome usually considered as indicating toxemia. The tubercle bacillus itself produces sufficient toxine to cause all the toxemia usually met with in tuberculosis and a mixed vaccine could have little effect.

Tuberculins, toxins, and stock vaccines, have fallen largely into disrepute of late years. It would be useless and unnecessary to take you back through the decades since Koch electrified the world with his announcement that he had an absolute cure for tuberculosis in tuberculin, or to dwell upon Trudeau's statement that after using tuberculin for twenty-five years he was convinced that more patients were alive who had received it than those who had not. Is it any wonder that many of us became extensive users of this once heralded specific? I was an ardent believer in the efficacy of tuberculin until three years ago, when I practically discontinued its use. I used it both in sanitarium and ambulant practice for a period of ten years, in every afebrile case, and must confess that my published viewpoint of a few years ago has somewhat changed. Tuberculin, however, properly employed, beginning with very small doses

and gradually increasing without reaction until a tuberculin tolerance is achieved, never harmed anyone and in many cases helped toward an arrest. The psychology in its administration was always greater than its therapeutic value. Bullock, who recently reviewed his twenty years' experience with fifteen hundred cases, states that in the third five years when he was using tuberculin his results were better than in any other period. He attributes this to the fact that patients receiving tuberculin stayed longer at the sanatorium than those who did not, thus permitting other methods of treatment to become effective. Perhaps in this way we can also account for Trudeau's experience.

Remember always, tuberculosis is a disease of undernutrition and lowered resistance. To secure favorable results resistance must be raised—this requires time, often lots of time—and the patient must receive some definite form of treatment upon which to pin his faith while nature is being assisted. Tuberculin, never a specific, might stilll be largely used as a valuable adjuvant if used wisely. Many have used it improperly and produced untoward results. Some apparently did not appreciate the fact that the tuberculous patient manufactures tuberculin at all times, that antibodies are constantly produced, and that artificial tuberculin, if it accomplishes anything at all, simply stimulates these antibodies, or they might better be termed "natural defenses."

Tuberculin cannot introduce anything new. Still, after all these years with the proven failure of Koch's tuberculin, and its various modifications under different names, we have scientists announcing new specifics in the products of the tubercle bacillus. One of the latest is Much's "Partigens" or partial antigens.

Much comes forward with the announcement that the cure of tuberculosis lies in the non-toxic rather than the toxic product of the tubercle bacillus, claims to have isolated this product, demonstrates its efficacy on tuberculosis in animals, and proceeds to make many, particularly in Germany, use it on human beings. His clinical associate, Deike, is more conservative, stating in his recent book that partigen is merely a mild form of tuberculin, safe in its use, and which does not produce temperature or other measurable reactions. We have a right to ask Much why the non-toxic product of the tubercle bacillus is more specific in its action than the toxic. He states this, but he does not prove it.

Koch, before he announced tuberculin as a cure for humans, also experimented for years on animals. He cured tuberculosis to his own satisfaction in animals, and still he has been proven wrong, as regards the efficacy of tuberculin in humans. Much and his associate to date have shown some results in surgical and gland tuberculosis, not better, however, than those accomplished by ordinary tuberculin. We have as yet to see any report on the successful cure of pulmonary tuberculosis by the administration of "Partigens." I do not want to appear as discouraging new investigations, but I do deplore the fact that so many remedies still in the experimental stage, are heralded to the public as cures.

Tuberculin still has its place in our tuberculosis armamentarium. It should not be discarded; it should be used sparingly, cautiously, and only in the case which is not progressing with other methods. We at one time used too much tuberculin—perhaps we are now not using enough.

Artificial pneumo-thorax or, as it should be termed "lung collapse," has come to stay. Its results in many cases have been brilliant. It is the one therapeutic measure in tuberculosis which has stood the test of time. Originated by Murphy in this country, and improved by Forlanini in Italy, and Brauer & Spengler in Germany, it is largely used today in unilateral tuberculosis of a progressive type. The principle behind pulmonary collapse is sound and for that reason our therapeutic result is definite. It puts a splint upon a diseased lung, thus inhibiting the latter from pouring toxins into the system, and in this way reduces temperature and night sweats. By direct pressure it often inhibits cough. By alleviating symptoms, the patient is placed in a condition so that other methods will help build up his resistance. In other words, artificial pneumo-thorax treats a broken lung on the same principle that a splint treats a broken leg. The method should be reserved for patients with unilateral lesions, or slight involvement in the other lung, and where a definite period of trial with hygienic and dietetic therapy shows no result.

Collapse therapy often fails of success on account of dense adhesions. For this group we are now attempting partial collapse by admitting 50 to 150 cc. of gas at intervals of one week or oftener. In this way, small areas are compressed, with cessation of symptoms in some cases. In this country the puncture method of Forlanini, rather than the cutting method of Brauer, is universally employed. The method is not without risk. Although since 1912 I have performed over 2500 original compressions and fillings without any but the usual complications, such as effusions, skin emphysema, slight hemorrhage and one bronchial fistula which subsequently healed, there has been one more serious complication.

In the case mentioned, the patient, a young lady, had left the sanatorium after seven months, with disappearance of all symptoms. She returned weekly for a filling of 300 to 400 cc.; during the last of these, the trocar snapped within a half-inch of the hilt, leaving one and a half inches in the thoracic cavity (demonstration of plate showing trocar). After consulting with surgeons, we decided not to attempt removal of the trocar. The last X-ray picture shows diminution in the shadow of the trocar, which means that it is imbedded in the lower end of the thoracic cavity. The patient suffers no ill effect except her own mental disturbance. I quote this instance to prove that with the best technique, artificial pneumo-thorax has a percentage of risk, and that the accident reported above, although unique, may happen occasionally.

Thorocoplasty or lung collapse by removal of all the ribs on the affected side is being recommended. Eloesser has reported five cases success-

fully operated. This method is drastic, but strange to say, if properly executed, not deforming. It should be reserved for those cases where artificial pneumo-thorax is not applicable, and only after the patient is made fully cognizant of what the procedure may do to him.

Heliotherapy has been used with great success by Rollier in Switzerland for joint and gland tuberculosis, especially in children. The method consists of gradually exposing each part of the body to sunlight, beginning with a few minutes daily, until the patient lies naked in the sun for several hours each day. I have had splendid results with this method in stubborn and recurrent gland tuberculosis and shoulder and knee sinuses. We are now trying direct sunlight on rectal fistulae and ulcerations. Where heliotherapy has not succeeded, the failure may be due to faulty technique. It must be carried out gradually over months or years, and the entire body must be exposed until complete pigmentation is achieved. For laryngeal tuberculosis we use a magnesium laryngoscope invented by Frank Verba of Colorado Springs, teaching the patient to direct the sunlight into his larynx. I have recently reported seven cases treated with this method. Even in advanced laryngitis, where arrest is not possible, we get alleviation of pain, thus permitting the patient to swallow comfortably and to take nourishment. Heliotherapy is contra-indicated in pulmonary tuberculosis except in beginning cases.

Hygienic and dietetic treatment is our original, best and most dependable method. It consists of rest, fresh air, good food, sunshine and proper medical advice, under proper conditions. This sounds like a simple program, but is often carried out with great difficulty. Rest means absolute rest in bed until symptoms have become quiet. Here we often meet strong opposition on the part of the patient, who naturally chafes under restraint. We must then study our patient's psychology, or as is popularly termed today, use psychoanalysis, tell him all about himself, what we are trying to accomplish, and make him a willing and enthusiastic partner in the business of getting well, rather than a rebellious patient taking orders. We often hear the family, patient, and physician ask, "Why can't so simple a procedure be carried out at home?" Why must the patient go to a sanitarium? Home treatment of tuberculosis is comparable to learning engineering in a correspondence school. At home the system must be brought to the patient; at the sanitarium he becomes part and parcel of the system. Every case of tuberculosis except the hopeless and temperamentally unfit should spend a shorter or longer period of time at some well-directed sanitarium, in order to learn the meaning of tuberculosis and how to care for himself and protect his family and neighbors from infection. He should also learn how to prevent relapse after an arrest is once accomplished.

Unfortunately, the treatment of tuberculosis is expensive and many cannot afford to go to private institutions, and will not go to public ones. The scope of this paper will not permit of economic and sociologic discussion of how to provide care for the man of modest means in the founding of semi-endowed institutions, which could take patients for a moderate fee, such as Trideau's at Saranac and Barlow's in Los Angeles.

In the important question of feeding we have come to realize that overfeeding in unnecessary and injurious—that proper feeding means giving the patient all he can comfortably assimilate and sufficient to restore his weight to normal. We must individualize with food as well as medicine. The patient's peculiarities must be considered. He should not be forced to eat food he doesn't like or want. Some patients cannot tolerate large quantities of milk and eggs, and this intolerance should be respected. Often the success of treatment stands or falls upon getting a patient to eat. The word "individualization" has come to mean the keystone in tuberculosis therapy, but its uses in the fuller sense are not universally employed. The fundamental principles underlying our treatment are the same for every patient. Their application, however, must be changed to meet the peculiarities and needs of the individual.

I have tried to as briefly as possible review our present known methods for treating tuberculosis. To go into detail on any one of these would require a paper on each. Have I sounded a pessimistic note? If so, it is not because I am personally pessimistic regarding the treatment of pulmonary tuberculosis, but rather that I desire to utter a word of warning against unreliable cures and to plead for the support of proven and tried methods.

If 80 per cent of all beginning cases of tuberculosis can get well, why does the attendance at sanatoria show 50 per cent and over of advanced cases? Why do we get undiagnosed tuberculosis? Surely, with the diagnostic means at our command, particularly the X-ray, every educated physician can make an early diagnosis of tuberculosis. When the diagnosis is made, the patient should be frankly and honestly informed and then given an opportunity to get well. Treatment may be started at home, if considered advisable, but if the patient does not improve something else should be done before his condition becomes advanced and hopeless. In spite of any and all methods of treatment, if the patient's natural resistance cannot be increased he will not get well.

CONCLUSIONS

1. The successful treatment of pulmonary tuberculosis depends upon building up the patient's natural resistance, as well as individualization and a study of the patient's psychology.

2. Time being the essence in treatment, early recognition of the disease, and the immediate resort to well established and proven methods, such as rest, fresh air, sunshine, good food, and proper medical advice is most important.

3. All good methods of treatment have a place in selected cases.

4. Whether the cure of tuberculosis will be discovered through bacteriology, serology or chemotherapy, the future alone can tell, but at present we possess absolutely no specific.